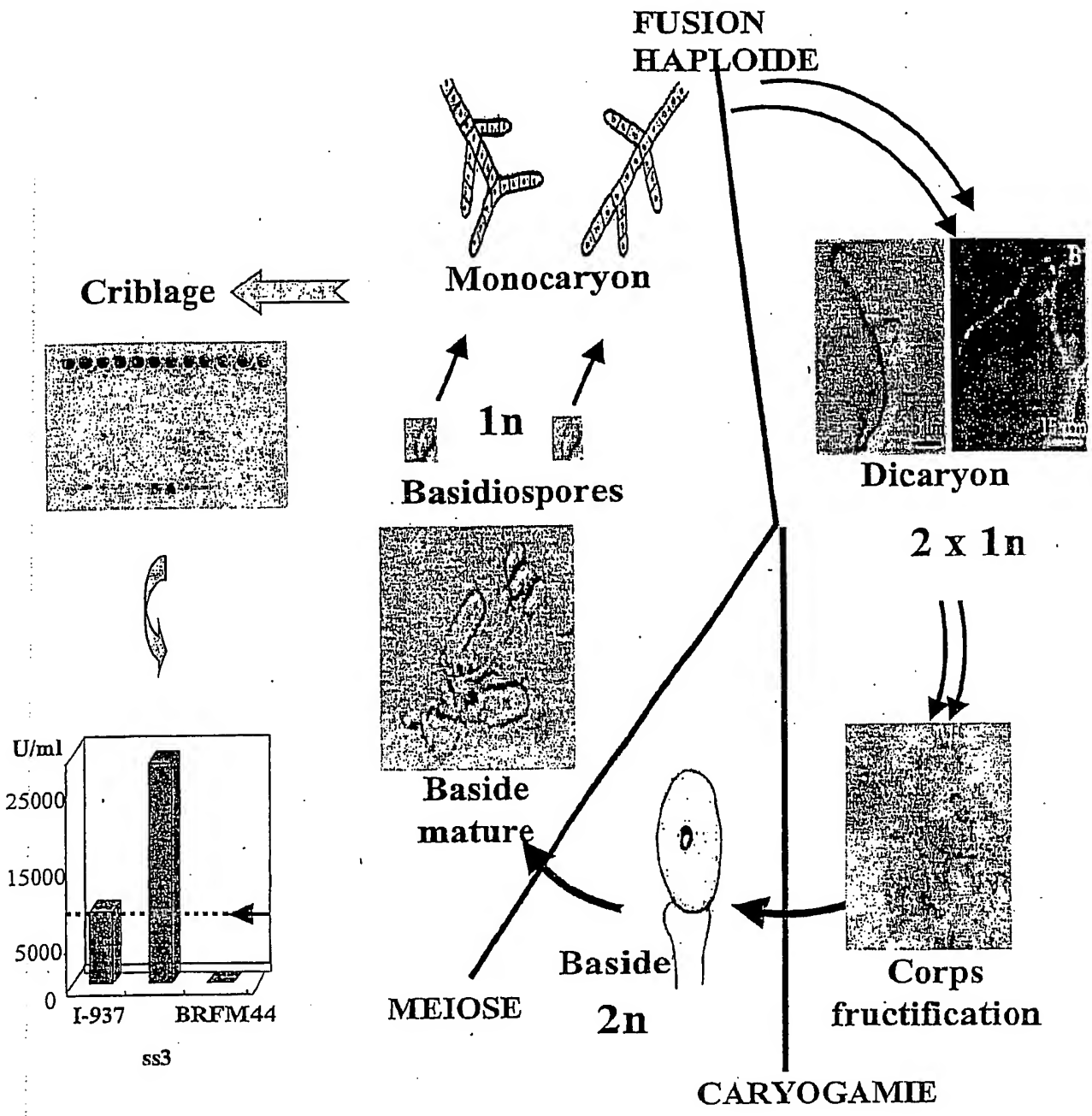

Figure 1 : Isolement de souche monocaryotique déficiente pour l'activité laccase

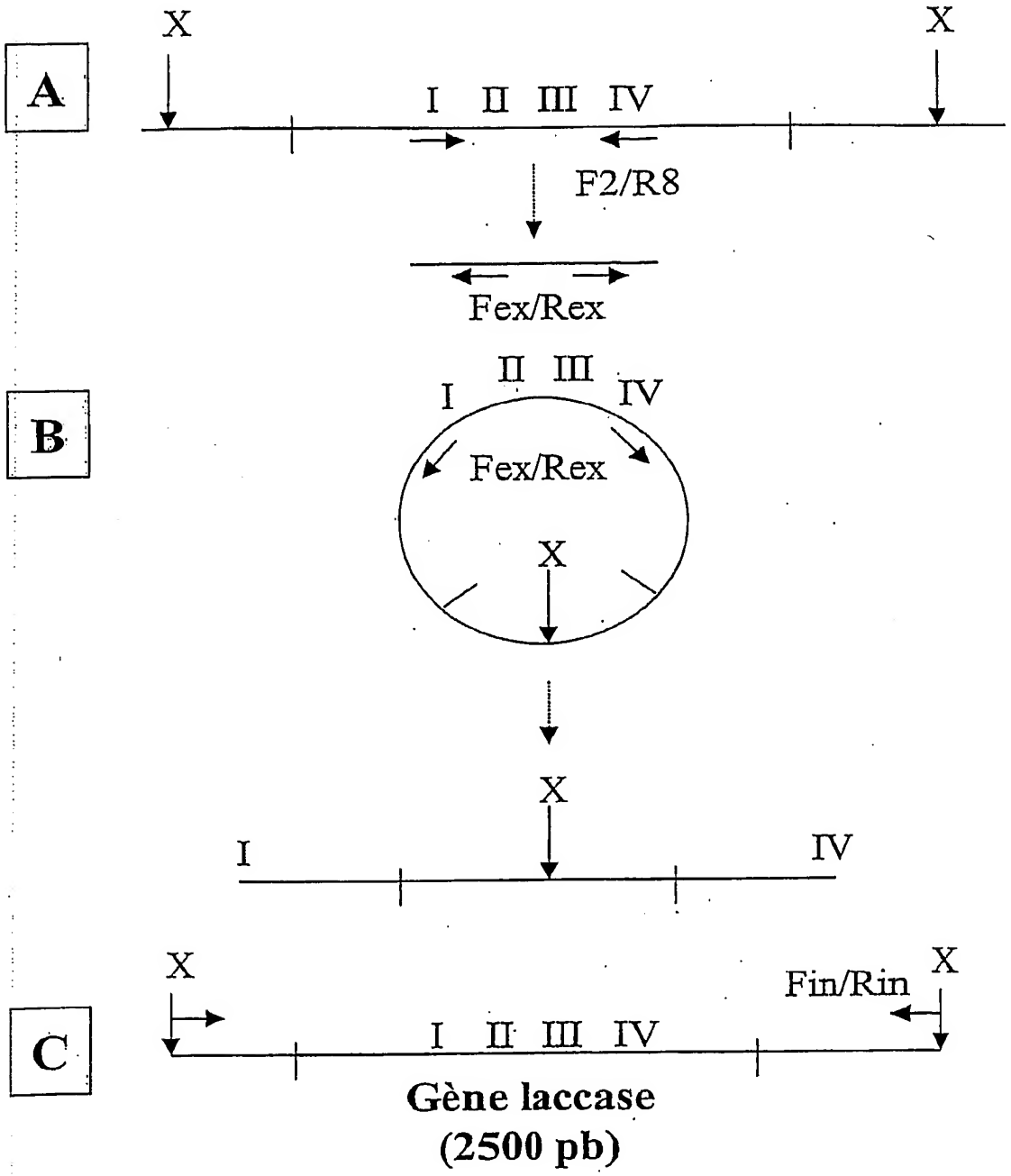

Figure 2 : Isolement du gène codant pour la laccase de *Pycnoporus cinnabarinus* laccase

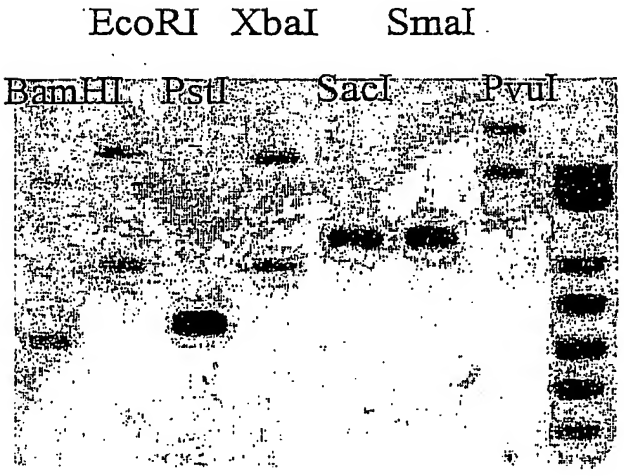

Figure 3 : Etude en Southern blot du gène codant pour la laccase de *Pynoporus cinnabarinus*

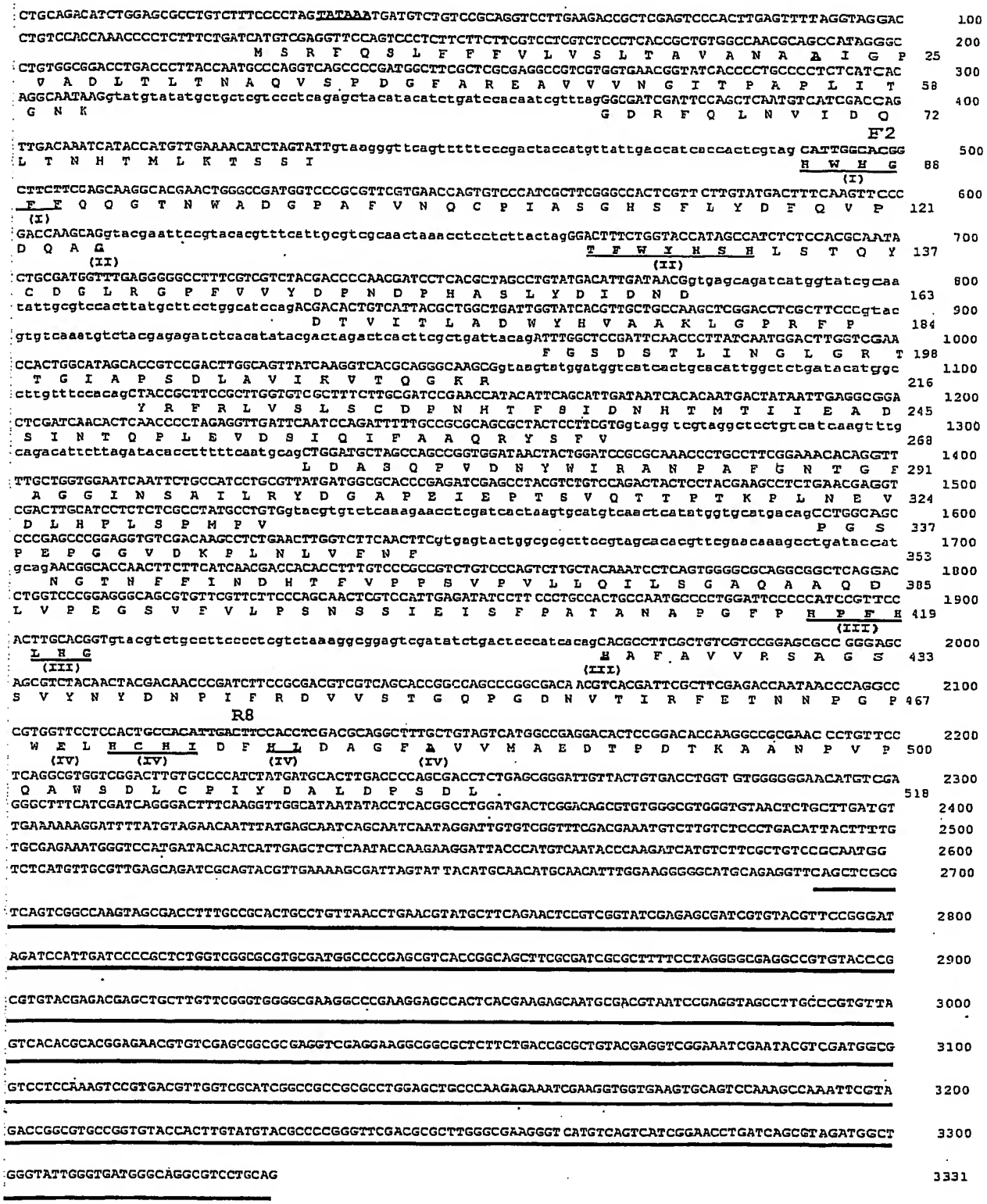

Figure 4 : Séquence du gène codant pour la laccase de *Pycnoporus cinnabarinus*

AGATCTCCGAACCAGAAATGCGATTGCGTTCAGGCCCAATTAAGAATAAAGCTGCGTCAGGGCAGCGACGTA
TCTTGATCCATCATTGACTCACCGGCATCGGCGTCAACACCAAAGCAAGCTCGTCCCACCCATAGGCGTGCA
CCGGCCGGCGTGCGCCATTGAGGTACATGAGCGGGGCGAAAGTCCGCCATTGGTAGCCCTGTCGTGGACGCG
CGGCGATGAAACGTTTCCCACCATTGGGAAGAAACGTCTGCGGCCCATCATCCCTTCACCGGATGACAAGGC
GGCGTCGCGCCTTTGCCGCAGAGGCCGGCGGGCGACATGCACAGCGAAGGTCCGTTGCGGATGGGAAGCAGG
CAATCAGTGGGTGTCCTACGCCGCCACGATGGTCGGGGAGCGTAGGCGCCCTCCCATAAGGCGGCAAGCATC
ATGATGCTCTCCGATTCGGGAAGCCTGGTGCGATGCTGGAGAGACTCTCTCCGAGAGACCAGTGTGCGCAAC
GTTCCTGGCCTGGAAGACTTTAAAGTGAGTGTAGAAGGGCGAGCAGAGGACGATCATCGGATTGCAGGAACC
ATCGGCATCCTCAGCCTGGGAAGGATGGCTCTTGGTAGACATTCGCGGAAGGTGTCCTAGATGTGAGCGGGC
TTCTTGGATGATCATGTCGTAACTTTTTCTGACCTCGTCGGTGGTACGCATGGCAGGATTGAGCATTACGGT
ATGCCTCCCATTCATAAACGATAACCCCTTCCTTCAGGTTGGTCATCTCCATAGAGCGGCACGCTCTCAAGG
CCTAGGCTATTCACACCTCCTTCGCAACATCCCTATTCACGGTGTCTGTAAGGAACGACTTGTCATGGGATC
ACATGAAGTGCAGCATACTGTTCGCCGGTCTCGCAGTACAGACGCTAGTACGGGAAGTCGACATCCAAGCGT
TCAGTCACCACATGGCAAAAAAGCTGCACCATACTCTTTATGGTGAGTTGTTCGTGAGTGGTATACAGTCAT
TCATGAGGGAATGCCCACCGGATAGGGTGTGGCGGCCGCAATATTCATCGCCTGGCAATAGTCGATGTGCGT
CCTTGTTCAATGAATATCATGGGTCACATGTGGAGACGGTTAAACAGCGTTGACTGTGAATCCCTGGTGTGT
GTTGGGCCGAACAGGTACGTTGCAGGAACACCAATATCTCTTCGGCAGCCCAGTTCTTTGCGAGCGGCACAG
GCAGGCATCGCGCAACAGATCCCAGCCATCCGGCCTCTGACATTCGGGATACCTGAAGCCCTTCAGGTACGG
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GTGAAAGGCTCCATCATATAGCGGCTCAACTCTACCTCGAATGTCCAAACACGGCGGGAATACTTATTTATG
TGGACAAGGCCGAGCTATGATAGCTTGCTCCCGAAGTTGGTAAGTCCCGCAATCTGCGGTTCAGGCAACAGT
CTCGGAAAAATAAGAAGAATATTGTAGGTGCGTGTAGGCGTATCGCCCAAATGCGCACACACGGAGGCTTTA
GGAGATGAAGCGCCCGTGAGCGGTAAGGGAGTTGGTTCACCGCCGCCCCGACCGACTCTCTCTCTTTCCCAG
CATCATGTCTCGGCGCAAACTTTACCCTCTATTGACCAACTCCACGAGAAAGCAGGAACAGCTTCCTTGTCT
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GTCAGCCTGGCCAGTGCGTAGTCCCGTCTCTCTTGCTGCACTAGAGAAGCCCCATGAGACAGCGTTTTTTGC
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GATTCCCAGTTTTTCTCCTCGGTCTGAATCGGCTGCACGGCAGATAAATCGGCCGGAAATGCTATAGCCCTT
CATAGCCCGCTATGAGAGTCGCAAAAGGCTTGTCAGTCAGGTCGGTCGAGTGGCTCTCACGAAGAGCGTCAA
CTTCGCGCGACAGCCGCCTTTCAGGGCAAGATAGATCCTCCCATCATCCCCTACTGCGCTCAGCGCCGGTAC
CGAACAATTGACTTACCGACATCCTCCGGGACGCGCAAATGCTGTTCGACGGAACGTAATCCTCTTCGTCCC
GCCTCTTTTCGCTCTCACGCATTCCGTGTGGTTCGCGCGACGGCCGCTCATCAGGACCAGACCAGTCTCAAT
GTCTGGTACCGGCACAATGGTGACACTGCGGCAACTGAGTAGGTCTGGTCACTCTGGTGCACCGTCGCTTAC
GCTGACCTTCGGGATACTGTCCTGCAGACATCTGGAGCGCCTGTCTTTCCCCTAGTATAAATGATGTCTGTC
CGCAGGTCCTTGAAGACCGCTCGAGTCCCACTTGAGTTTTAGGTAGGACCTGTCCACCAAACCCCTCTTTCT
GATCATG

Figure 5 : Séquence de la séquence promotrice du gène codant pour la laccase de *Pycnoporus cinnabarinus* (jusqu'à l'ATG codant pour la méthionine de la laccase)

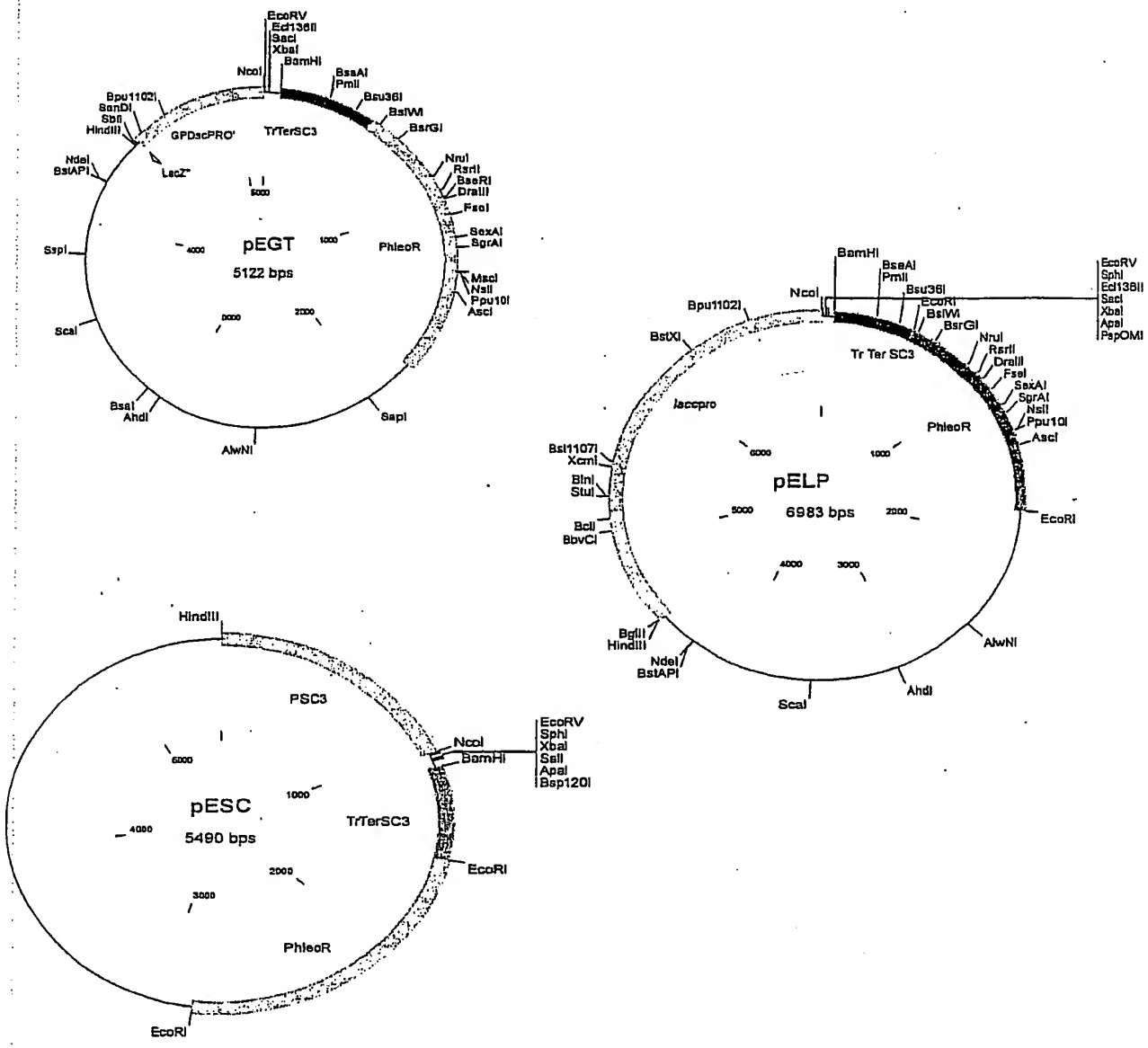

Figure 6 : Carte physique des trois vecteurs d'expression utilisés pour la production de la laccase chez *Pycnoporus cinnabarinus*

CATGGGATATCGCATGCCTGCAGAGCTCTAGAGTCGACGGGCCCGGTACCGCGGCCGCCTTAAGACGCGTGGATCCGCAGGTGAAC
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CATAGGGTCGCGGACAAGTGATCGTCTTGCTACATACTCCAAGGTGTTGACTCATTCCCTCGATAATGAACATTGTTGTTGTTGTTG
TTCTCTATCCGCTCAGTCACGCGACCCCACACGTGCATGGTTGAACTTCGCCACGCAACAACCGCATGACGACATGGCGAACCTAAG
TAAAGGCTGAGTCGTGGACTAAAGCACTCCACTTTACGGCGAGGATGCCAGTCTACGTCATGAATGAAGCCTCAGGTCCCGAAGTAA
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CAAAAAGGTTCTGCCCGTACGCCCGCGAAATTCCTTCGAGGTGGCCCCTATCGCATACATGCACGACTTCAAAACATCCATTCTATC
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CCACACCCAGGCCAGGGTGTTGTCCGGCACCACCTGGTCCTGGACCGCGCTGATGAACAGGGTCACGTCGTCCCGGACCACACCGGC
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TGAACACATCGGCGGCGGCCTGGACTGCGCGCCATCTGCAAATGCCCAGCCAGTCCCGTCGGGCGCCACCACCAGCCCTGGTCGAGT
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TGGGCTGCGACCCTGTCTACCTCTCATCCTAACCCCTCCGCGGCTTCGCAGTACAGTTACTAATCTCACACCGAAGAGGCTCTCGCGC
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GCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCG
GTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAA
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AGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCC
CTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTC
ACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCC
TTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGA
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GCGTCGCCCTCGAGGGGGACTCGACCAGGGCTGGTGGTGGCGCCCGACGGGACTGGCTGGGCATTTGCAGATGGCGCGCAGTCCAG
GCCGCCGCCGATGTGTTCATCCCGTTTTGTCAGTATCGATCGGATCTTTCGGGCGTGGGTATAAAAGCGCGCCGCCCGCCGTCTCCCT
CTTTCTCCAGCACTCCCATCCAGAGCACTTCCCTCTCCCATCGCATCCCATCACACAATAATGCCCATCAC

Figure 7 : Séquence nucléotidique du vecteur pEGT, contenant le promoteur du gène gpd (4480-5122), un marqueur de résistance à la phléomycine (507-1822) et le terminateur du gène sc3 (71-507).

AGCTTCTCCGGCCCCGAATCGAACGGCAGGATGTGTGGGCGTGTCCAATATTGCCATGAAAATCTGTCAGAAGTGAGCCCTCTCGTCAC
CCTGTACAGCTTCGCTGAGTTGAAAAGCAGGGTTCATCTTGGGCTCACTGATGCACTGAGCTCGACCGGAGAACTAAATGACCAGCCGG
AGTGTTCACTAACTTAACGCCGGGTATTCAGGGCAGCTTCTCTATGTTGCGCCTACGACGTAGATCACCGCCCATGAACGGGGGAAACG
GGGAGGGGTGCGTTTGGTACGTCTTTACGTCTGGCTATGTTGTATTGACCAGCGTCTGCAGAAGATGGGCACGACGATGCGCCGAGCCG
GCCAGTGTCGTCGGATGTCCACTGTTGAGGCCATCCTTTTGCTAGACAGACGGAAGAGCTTTGGAGGTGCGATTCCTCTACGAATGGGA
AGGGGCTTAGATGGAGAGTGACACGTCTGAGCTCCCCAACACGCCTTCGCCGAGGGTGCGTCTCCGCGGACATTCACCTCAGTTCATTG
TTCTGACCTGCCTAATTGTATAGACCGGCCAACAACCTTGCTGACGCCCATCATAACAGTGCCCTGCACAGAGCCTTCCCACTCAGTCGG
CGCCTCCCTCAATCAATCCCACTAACTCGCCGGCTCTGCCCCTTCGCCGCTCGACACGTCGCTTGGAAGAGCCCGGGCACGGGCGTCCGC
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CAGGCGCGCGGGGACCTGGCACGCGCGGCATGAACATGCAGACTTGGGTGACGATAACTTGAACTCAGACGCGGCGAATGAATATCCA
AACGCGCGGGAAGAAAATAATTTACGGGAGCCTCCCCAGGTATAAAAGCCCCTCACCCGCTCACTCTTTCTCCAGTCGAACACCCCAGT
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GGGCCCGGTACCGCGGCCGCCTTAAGACGCGTGGATCCGCAGGTGAACGCGCCTATCGGTGGGATATTCGGGCGACGGGAGCCTCGGC
AATCTGAGCCTCGTTACTGCCTAGCAAATTCGGAATCCCTTCGATGTCATAGGGTCGCGGACAAGTGATCGTCTTGCTACATACTCCAAG
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CAGTCTACGTCATGAATGAAGCCTCAGGTCCCGAAGTAAGGGGGTACAAAAGGAGGGTGAAAGGTGGACGTTTTCTTACCATCCTTCCA
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CATACATGCACGACTTCAAAACATCCATTCTATCATTTTGGGATCGTACAATTATTAGACATGTTGTACAACGTTACATTCCTTTCTTCTT
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GGACCGGCGGTGTTGGTCGGCGTCGGTCAGTCCTGCTCCTCGGCCACGAAGTGCACGCAGTTGCCGGCCGGGTCGCGCAGGGCGAACTC
CCGCCCCCACGGCTGCTCGCCGATCTCGGTCATGGCCGGCCCGGAGGCGTCCCGGAAGTTCGTGGACACGACCTCCGACCACTCGGCGT
ACAGCTCGTCCAGGCCGCGCACCCACACCCAGGCCAGGGTGTTGTCCGGCACCACCTGGTCCTGGACCGCGCTGATGAACAGGGTCACG
TCGTCCCGGACCACACCGGCGAAGTCGTCCTCCACGAAGTCCCGGGAGAACCCGAGCCGGTCGGTCCAGAACTCGACCGCTCCGGCGAC
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CCTTCTCGCACCTGGGCTGCGACCCTGTCTACCTCTCATCCTAACCCCTCCGCGGCTTCGCAGTACAGTTACTAATCTCACACCGAAGAG
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ACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTA
GGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTT
ACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACG
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GGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAAC
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GGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTG
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CATATGCGGTGTGAAATACCGCACAGATGCGTAAGGAGAAAATACCGCATCAGGCGCCATTCGCCATTCAGGCTGCGCAACTGTTGGGA
AGGGCGATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGT
TTTCCCAGTCACGACGTTGTAAAACGACGGCCAGTGCCA

Figure 8 : Séquence nucléotidique du vecteur pESC, contenant le promoteur du gène sc3 (1-1033), un marqueur de résistance à la phléomycine (1540-2855) et le terminateur du gène sc3 (1104-1540)

CATGGGATATCGCATGCCTGCAGAGCTCTAGAGTCGACGGGCCCGGTACCGCGGCCGCCTTAAGACGCGTGGATCCGCAGGTGAACGCGC
CTATCGGTGGGATATTCGGGCGACGGGAGCCTCGGCAATCTGAGCCTCGTTACTGCCTAGCAAATTCGGAATCCCTTCGATGTCATAGGGT
CGCGGACAAGTGATCGTCTTGCTACATACTCCAAGGTGTTGACTCATTCCCTCGATAATGAACATTGTTGTTGTTGTTTGTTCTCTATCCGC
TCAGTCACGCGACCCCACACGTGCATGGTTGAACTTCGCCACGCAACAACCGCATGACGACATGGCGAACCTAAGTAAAGGCTGAGTCGT
GGACTAAAGCACTCCACTTTACGGCGAGGATGCCAGTCTACGTCATGAATGAAGCCTCAGGTCCCGAAGTAAGGGGGTACAAAAGGAGG
GTGAAAGGTGGACGTTTTCTTACCATCCTTCCACCTCCCAGACCACCATGCCGGGAATTCCCAGCTTGCTCAAAAAGGTTCTGCCCGTACG
CCCGCGAAATTCCTTCGAGGTGGCCCCTATCGCATACATGCACGACTTCAAAACATCCATTCTATCATTTTGGGATCGTACAATTATTAGA
CATGTTGTACAACGTTACATTCCTTTCTTCTTTTACTCTCCGGCCCAGTCTATGTAGAGGTAAAGTACAAGCGTCCAAAGGATCAGGCACTT
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AGAACAGTCCTTCGCAGTCCTTCTCGCACCTGGGCTGCGACCCTGTCTACCTCTCATCCTAACCCCTCCGCGGCTTCGCAGTACAGTTACTA
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ARATCAGATCCCCGGGAATTCGTAATCATGGTCATAGCTGTTTCCTGTGTGAAATTGTTATCCGCTCACAATTCCACACAACATACGAGCC
GGAAGCATAAAGTGTAAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTTCCAGTCGGGA
AACCTGTCGTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCACTG
ACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACG
CAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCC
CCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAG
CTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCT
CACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTT
ATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAG
GTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAG
CCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGA
TTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGA
TTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTA
AACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCG
TCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATT
TATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCC
GGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGG
TATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCT
CCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAA
GATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACG
GGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCT
GTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACA
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TATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAG
TGCCACCTGACGTCTAAGAAACCATTATTATCATGACATTAACCTATAAAAATAGGCGTATCACGAGGCCCTTTCGTCTCGCGCGTTTCGG
TGATGACGGTGAAAACCTCTGACACATGCAGCTCCCGGAGACGGTCACAGCTTGTCTGTAAGCGGATGCCGGGAGCAGACAAGCCCGTCA
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TGAAATACCGCACAGATGCGTAAGGAGAAAATACCGCATCAGGCGCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGCGATCGGT
GCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACG
ACGTTGTAAAACGACGGCCAGTGCCAAGCTTAGATCTCCGAACCAGAAATGCGATTGCGTTCAGGCCCAATTAAGAATAAAGCTGCGTCA
GGGCAGCGACGTATCTTGATCCATCATTGACTCACCGGCATCGGCGTCAACACCAAAGCAAGCTCGTCCCACCCATAGGCGTGCACCGGC
CGGCGTGCGCCATTGAGGTACATGAGCGGGGCGAAAGTCCGCCATTGGTAGCCCTGTCGTGGACGCGCGGCGATGAAACGTTTCCCACCA
TTGGGAAGAAACGTCTGCGGCCCATCATCCCTTCACCGGATGACAAGGCGGCGTCGCGCCTTTGCCGCAGAGGCCGGCGGGCGACATGCA

Figure 9 : Séquence nucléotidique du vecteur pELP, contenant le promoteur du gène laccase (4457-6983), un marqueur de résistance à la phléomycine (507-1822) et le terminateur du gène sc3 (71-507) (suite de la séquence, page suivante)

CAGCGAAGGTCCGTTGCGGATGGGAAGCAGGCAATCAGTGGGTGTCCTACGCCGCCACGATGGTCGGGGAGCGTAGGCGCCCTCCCA
TAAGGCGGCAAGCATCATGATGCTCTCCGATTCGGGAAGCCTGGTGCGATGCTGGAGAGACTCTCTCCGAGAGACCAGTGTGCGCAAC
GTTCCTGGCCTGGAAGACTTTAAAGTGAGTGTAGAAGGGCGAGCAGAGGACGATCATCGGATTGCAGGAACCATCGGCATCCTCAGC
CTGGGAAGGATGGCTCTTGGTAGACATTCGCGGAAGGTGTCCTAGATGTGAGCGGGCTTCTTGGATGATCATGTCGTAACTTTTTCTGA
CCTCGTCGGTGGTACGCATGGCAGGATTGAGCATTACGGTATGCCTCCCATTCATAAACGATAACCCCTTCCTTCAGGTTGGTCATCTC
CATAGAGCGGCACGCTCTCAAGGCCTAGGCTATTCACACCTCCTTCGCAACATCCCTATTCACGGTGTCTGTAAGGAACGACTTGTCAT
GGGATCACATGAAGTGCAGCATACTGTTCGCCGGTCTCGCAGTACAGACGCTAGTACGGGAAGTCGACATCCAAGCGTTCAGTCACCA
CATGGCAAAAAAGCTGCACCATACTCTTTATGGTGAGTTGTTCGTGAGTGGTATACAGTCATTCATGAGGGAATGCCCACCGGATAGG
GTGTGGCGGCCGCAATATTCATCGCCTGGCAATAGTCGATGTGCGTCCTTGTTCAATGAATATCATGGGTCACATGTGGAGACGGTTAA
ACAGCGTTGACTGTGAATCCCTGGTGTGTGTTGGGCCGAACAGGTACGTTGCAGGAACACCAATATCTCTTCGGCAGCCCAGTTCTTTG
CGAGCGGCACAGGCAGGCATCGCGCAACAGATCCCAGCCATCCGGCCTCTGACATTCGGGATACCTGAAGCCCTTCAGGTACGGAGC
GAAGAGGTGGGCTCTCTGCAGCGATTGGCGGACGGATAGCTGTATTTCCTCTCTCACCATTGGGAAGATGTGAAAGGCTCCATCATAT
AGCGGCTCAACTCTACCTCGAATGTCCAAACACGGCGGGAATACTTATTTATGTGGACAAGGCCGAGCTATGATAGCTTGCTCCCGAA
GTTGGTAAGTCCCGCAATCTGCGGTTCAGGCAACAGTCTCGGAAAAATAAGAAGAATATTGTAGGTGCGTGTAGGCGTATCGCCCAAA
TGCGCACACACGGAGGCTTTAGGAGATGAAGCGCCCGTGAGCGGTAAGGGAGTTGGTTCACCGCCGCCCCGACCGACTCTCTCTCTTT
CCCAGCATCATGTCTCGGCGCAAACTTTACCCTCTATTGACCAACTCCACGAGAAAGCAGGAACAGCTTCCTTGTCTCTCATGACGTCC
GCAATCCAGACCCTTAGCCGGTTCGTTACTCATCGTTATCCCTGCCGCCATCGTAGTGGAGTCAGCCTGGCCAGTGCGTAGTCCCGTCT
CTCTTGCTGCACTAGAGAAGCCCCATGAGACAGCGTTTTTTGCTTTATTTCTGCTGTTTCTATAGACACCATAGGGGCAAACGATCCTG
CACGCCCAGAGGTATTGGGCTCGTCAGATTCCCAGTTTTTCTCCTCGGTCTGAATCGGCTGCACGGCAGATAAATCGGCCGGAAATGCT
ATAGCCCTTCATAGCCCGCTATGAGAGTCGCAAAAGGCTTGTCAGTCAGGTCGGTCGAGTGGCTCTCACGAAGAGCGTCAACTTCGCG
CGACAGCCGCCTTTCAGGGCAAGATAGATCCTCCCATCATCCCCTACTGCGCTCAGCGCCGGTACCGAACAATTGACTTACCGACATC
CTCCGGGACGCGCAAATGCTGTTCGACGGAACGTAATCCTCTTCGTCCCGCCTCTTTTCGCTCTCACGCATTCCGTGTGGTTCGCGCGA
CGGCCGCTCATCAGGACCAGACCAGTCTCAATGTCTGGTACCGGCACAATGGTGACACTGCGGCAACTGAGTAGGTCTGGTCACTCTG
GTGCACCGTCGCTTACGCTGACCTTCGGGATACTGTCCTGCAGACATCTGGAGCGCCTGTCTTTCCCCTAGTATAAATGATGTCTGTCC
GCAGGTCCTTGAAGACCGCTCGAGTCCCACTTGAGTTTTAGGTAGGACCTGTTCCTCCACAACCCCTCTTTC

Figure 9 : Séquence nucléotidique du vecteur pELP (suite), contenant le promoteur du gène laccase (4457-6983), un marqueur de résistance à la phléomycine (507-1822) et le terminateur du gène sc3 (71-507)

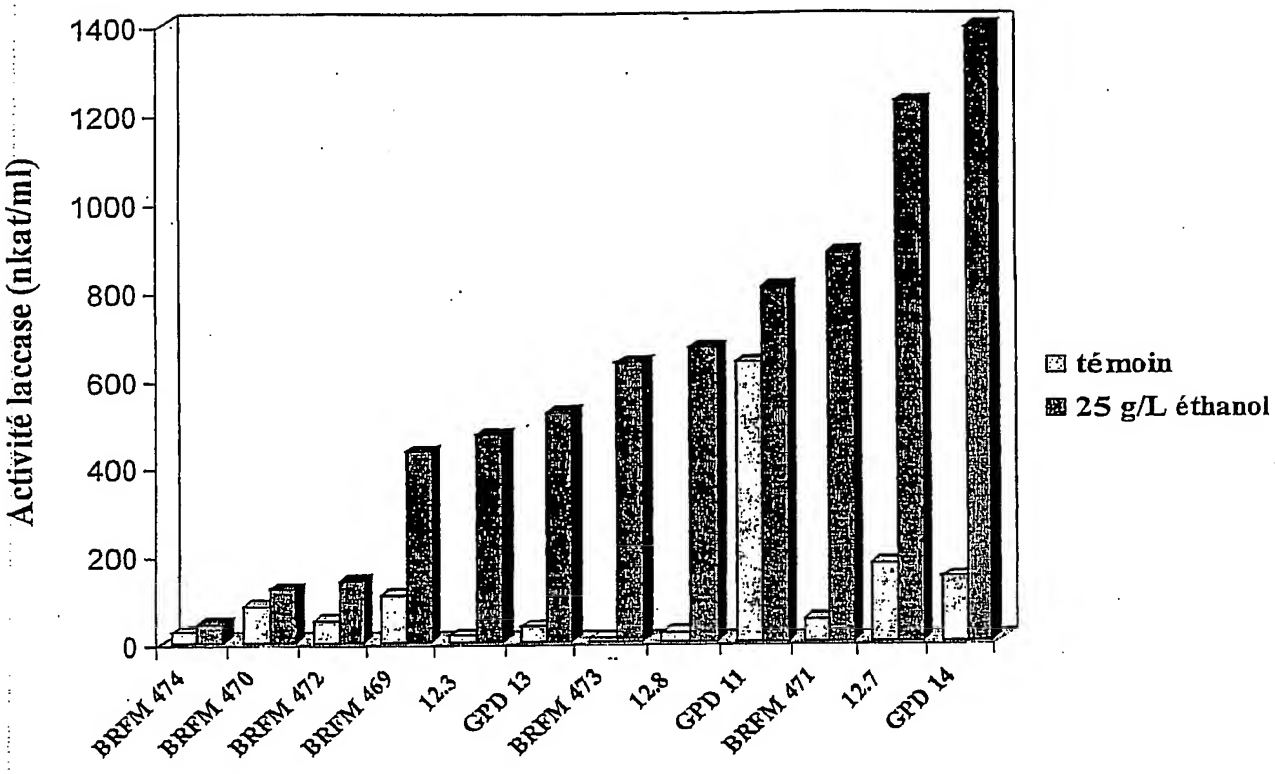


Figure 10 : Résultats de production des transformants présentant les activités les plus importantes. La culture a été effectuée avec ou sans (témoin) éthanol

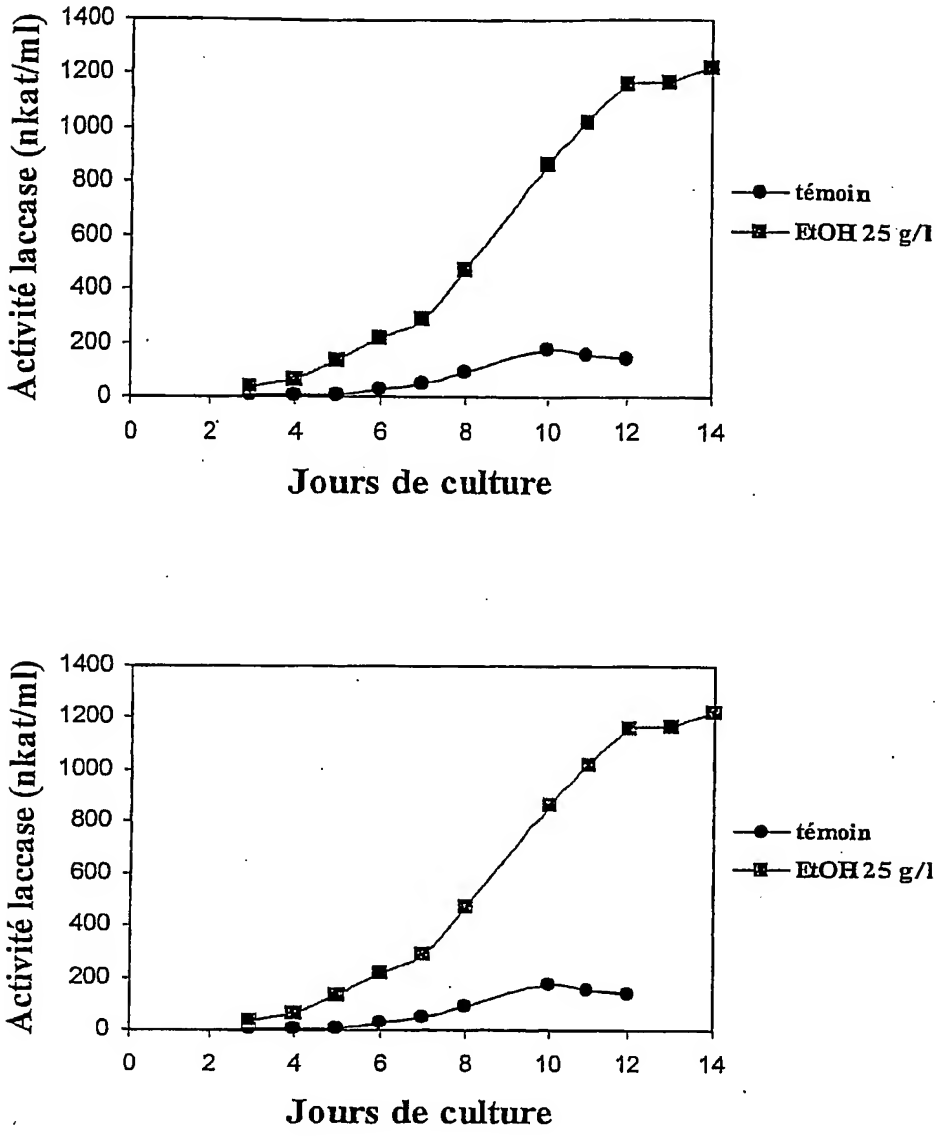
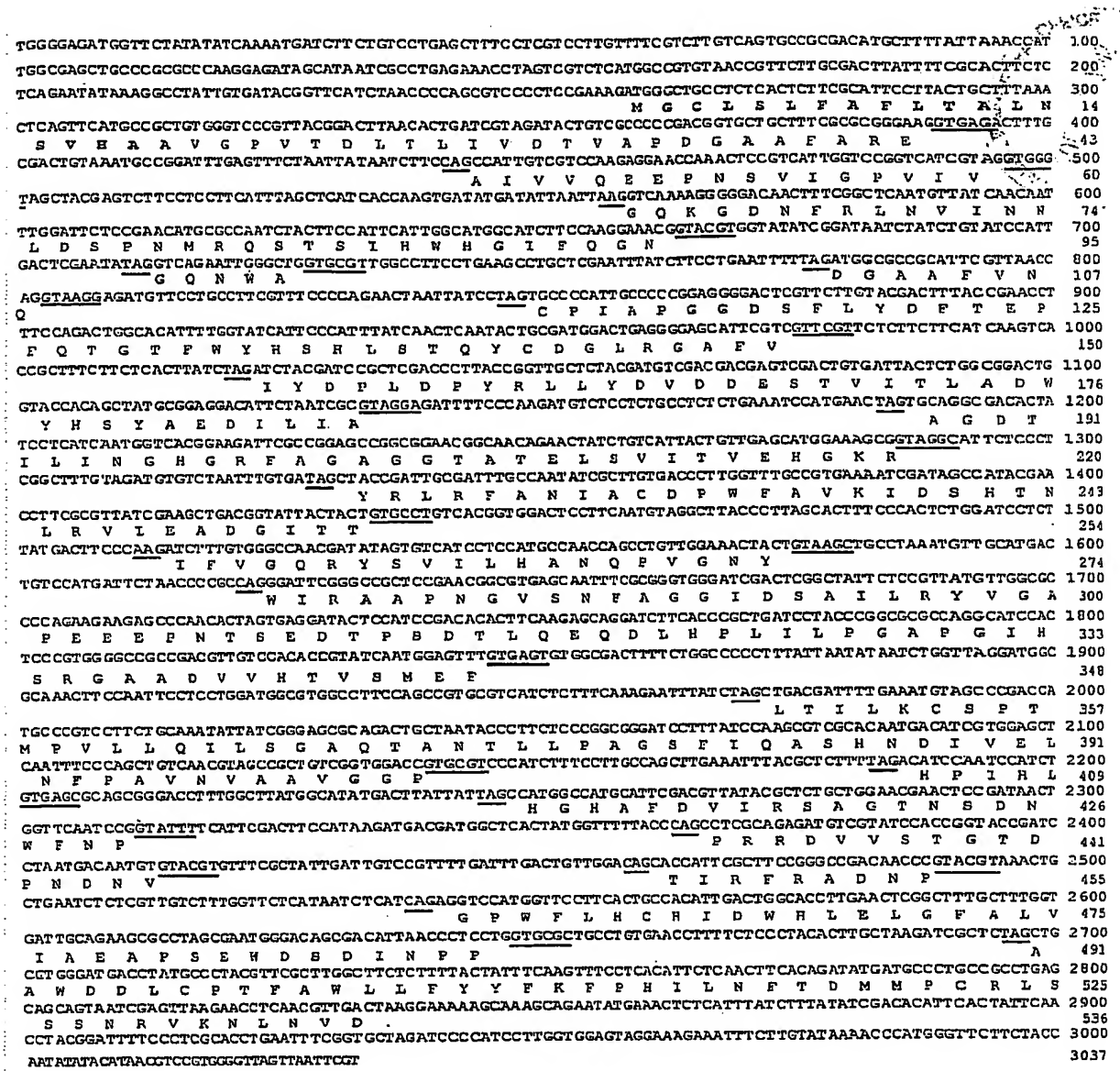


Figure 11 : Suivi des activités laccase des transformants GPD 14 et 12.7 en fonction du temps avec ou (témoin) sans éthanol



Gène de la laccase d'Halocyphina villosa

Figure 12